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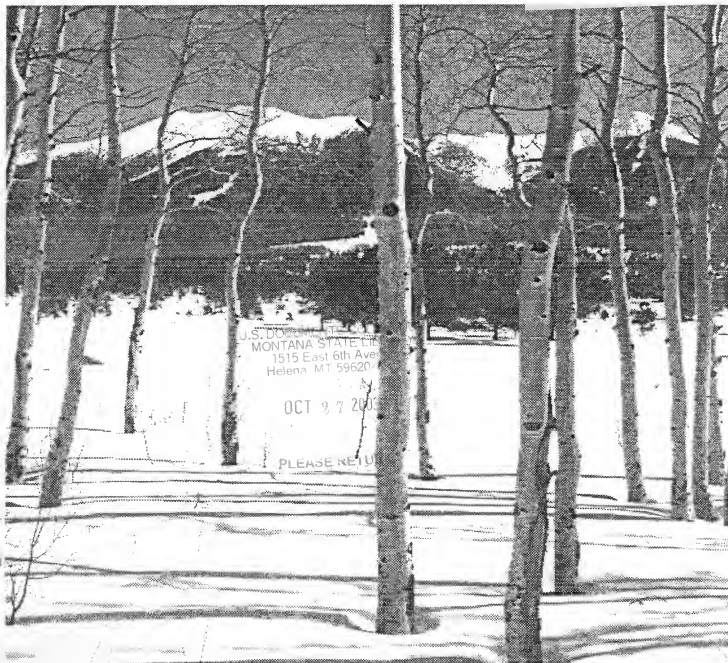
Soil  
Conservation  
Service



# Montana

## Basin Outlook Report

### June 1, 1994



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United States Department of Agriculture  
Soil Conservation Service  
Bozeman, Montana

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# Basin Outlook Reports

## and Federal - State - Private Cooperative Snow Surveys

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*For more water supply and resource management information, contact:  
See Attached List*

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### *How forecasts are made*

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Soil Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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# MONTANA Water Supply Outlook Report as of June 1, 1994

Surface water supply conditions across most of Montana are well below average and shortages in areas without reservoir storage will occur, unless there is an unusually wet spring and summer. Spring and summer inflow to reservoirs is expected to be well below average and reservoir storage is expected to be well below average going into next winter.

## SNOWPACK

Snowmelt is three to four weeks ahead of average. June 1 snowpack conditions in the fourteen major river basins of Montana are 85 percent below average and 67 percent below last year. Most snow courses will be melted out by the middle of June.

West of the Continental Divide, snowpacks were 81 percent below average and 46 percent below last year. East of the Continental Divide, snowpacks were 88 percent below average and 76 percent below last year.

RIVER BASIN	% OF AVERAGE	% OF LAST YEAR
COLUMBIA .....	19	54
EAST KOOTENAI B.C. ....	23	68
KOOTENAI .....	12	46
FLATHEAD .....	32	64
UPPER CLARK FORK .....	39	39
BITTERROOT .....	1	4
LOWER CLARK FORK .....	54	16
MISSOURI .....	16	34
HEADWATERS MISSOURI .....	12	17
JEFFERSON .....	13	28
MADISON .....	8	9
GALLATIN .....	8	11
MAINSTEM MISSOURI .....	16	213
HELENA VALLEY .....	0	0
MAINSTEM ABOVE FT. BENTON ..	3	23
MAINSTEM ABOVE FT. PECK RES.	16	213
SMITH-JUDITH-MUSSELSHELL ...	3	23
SUN-TETON-MARIAS .....	27	707
MILK .....	0	0
ST.MARY .....	54	128
YELLOWSTONE .....	9	16
UPPER YELLOWSTONE .....	9	13
LOWER YELLOWSTONE .....	9	20
WIND .....	6	14
BIGHORN .....	11	23
TONGUE (NORTH BIGHORN MTNS).	0	0
POWDER (SOUTH BIGHORN MTNS).	0	0





# PRECIPITATION

May mountain precipitation, for the fourteen major river basins, was 27 percent below average and 21 percent below last year and water year mountain precipitation was 22 percent below average and 12 percent below last year.

West of the Continental Divide, mountain precipitation during May was 18 percent below average and 8 percent below last year. East of the Continental Divide was 40 percent below average and 36 percent below last year. Water year precipitation west of the Continental Divide was 27 percent below average and 10 percent below last year and east of the Continental Divide was 18 percent below average and 12 percent below last year.

RIVER BASIN	MAY % OF AVERAGE	WATER YEAR % OF AVERAGE
COLUMBIA .....	82 .....	73
KOOTENAI .....	88 .....	70
FLATHEAD .....	82 .....	77
UPPER CLARK FORK .....	80 .....	76
BITTERROOT .....	90 .....	75
LOWER CLARK FORK .....	71 .....	69
MISSOURI .....	72 .....	79
JEFFERSON .....	78 .....	74
MADISON .....	89 .....	76
GALLATIN .....	62 .....	70
MAINSTEM MISSOURI .....	69 .....	80
SMITH-JUDITH-MUSSELSHELL ...	47 .....	82
SUN-TETON-MARIAS .....	96 .....	85
St. Mary and Milk .....	66 .....	83
YELLOWSTONE .....	49 .....	84
UPPER YELLOWSTONE .....	64 .....	77
LOWER YELLOWSTONE .....	34 .....	92



# RESERVOIRS

Reservoir storages state-wide were 5 percent above average and 11 percent above last year.

West of the Continental Divide, reservoirs were 2 percent above average and 17 percent above last year. East of the Continental Divide, reservoirs were 9 percent above average and 1 percent above last year.

RIVER BASIN	% OF CAPACITY	% OF AVERAGE
COLUMBIA .....	85 .....	102
KOOTENAI .....	69 .....	125
FLATHEAD .....	66 .....	84
UPPER CLARK FORK .....	97 .....	110
BITTERROOT .....	100 .....	112
LOWER CLARK FORK .....	94 .....	113
MISSOURI .....	87 .....	119
JEFFERSON .....	71 .....	100
MADISON .....	93 .....	112
GALLATIN .....	100 .....	146
MAINSTEM MISSOURI .....	84 .....	102
SMITH-JUDITH-MUSSELSHELL .....	99 .....	126
SUN-TETON-MARIAS .....	74 .....	127
MILK .....	87 .....	121
ST. MARY .....	93 .....	187
YELLOWSTONE .....	66 .....	101
UPPER YELLOWSTONE .....	67 .....	128
LOWER YELLOWSTONE .....	64 .....	100



# STREAMFLOW

Seasonal volume streamflow forecasts across Montana are 47 percent below average and 6 percent below last years forecasts.

West of the Continental Divide, streamflows are forecast to be 45 percent below average and 26 percent above last years forecasts. East of the Continental Divide, streamflows are forecast to be 49 percent below average and 27 percent below last years forecasts.

RIVER BASIN	JUNE-JULY FORECASTS	JUNE-JULY FORECASTS
	% OF AVERAGE	% OF LAST YEAR
COLUMBIA .....	55 .....	100
KOOTENAI .....	68 .....	59
FLATHEAD .....	62 .....	116
UPPER CLARK FORK .....	47 .....	95
BITTERROOT .....	27 .....	52
LOWER CLARK FORK .....	47 .....	86
MISSOURI .....	52 .....	74
JEFFERSON .....	29 .....	41
MADISON .....	54 .....	64
GALLATIN .....	54 .....	62
MAINSTEM MISSOURI .....	52 .....	75
SMITH-JUDITH-MUSSELSHELL ....	72 .....	85
SUN-TETON-MARIAS .....	74 .....	170
MILK .....	19 .....	--
ST. MARY .....	68 .....	123
YELLOWSTONE .....	50 .....	72
UPPER YELLOWSTONE .....	47 .....	69
LOWER YELLOWSTONE .....	52 .....	74

NOTE: The FORECAST AS % OF LAST YEAR column above, is this years forecast as a percent of last years forecast, not of what actually occurred.



# PEAK STREAMFLOW FORECASTS

Provisional daily peak streamflow volumes and dates for unregulated streams are as follows:

	CFS	Date	Percent of Average
COLUMBIA RIVER DRAINAGE			
Blackfoot R nr Bonner	5,270	5/13	55
Bitterroot R nr Darby	2,430	5/12	39
Clark Fk R bl Missoula	16,000	4/25	50
Clark Fk R at St. Regis	20,300	4/25	51
N Fk Flathead R nr Columbia Falls	13,700	5/13	65
M Fk Flathead R nr West Glacier	15,000	5/12	67
MISSOURI RIVER DRAINAGE			
Big Hole R nr Melrose	3,100	5/21	39
Gallatin R nr Gateway	3,770	5/13	70
Gallatin R nr Logan	3,010	5/13	54
Missouri R at Toston	8,490	4/26	45
Marias R nr Shelby	4,550	5/21	40
Smith R nr Ft. Logan	656	4/26	
YELLOWSTONE RIVER DRAINAGE			
Yellowstone R at Corwin Springs	14,400	5/13	82
Yellowstone R at Billings	28,600	5/14	67

## SURFACE WATER SUPPLY INDEX

The Surface Water Supply Index (SWSI) is an indicator of surface water supply conditions for the spring and summer months. Water users that rely on mountain precipitation can use the index to evaluate seasonal surface water supplies. The SWSI accounts for mountain snowpack, mountain precipitation, streamflow, reservoir storage, and soil moisture.

SWSI RATING	SURFACE WATER CONDITION
+3.0 to +4.0	Extremely Wet
+2.0 to +2.9	Moderately Wet
+1.0 to +1.9	Slightly Wet
-1.0 to +1.0	Near Average
-1.0 to -2.0	Slightly Dry
-2.0 to -3.0	Moderately Dry
-3.0 to -4.0	Extremely Dry





-1.7	Kootenai River at Ft. Steele (Kootenai in Canada)
-3.4	Tobacco River
-3.3	Kootenai Ft. Steele to Libby Dam
-0.5	Kootenai River below Libby Dam
-3.7	Fisher River
-3.4	Yaak River
-3.4	North Fork Flathead River
-2.8	Middle FORK Flathead River
-3.5	South Fork Flathead River
-3.2	Flathead River at Columbia Falls
-3.4	Stillwater/Whitefish Rivers
-3.4	Swan River
-2.8	Flathead River at Polson
-1.5	Mission Valley
-3.3	Little Bitterroot River
-3.0	Clark Fork River above Rock Creek
-3.0	Blackfoot River
-3.0	Clark Fork River above Missoula
-3.0	Bitterroot River
-3.0	Clark Fork River below Bitterroot River
-2.8	Clark Fork River below Flathead River
-1.4	Beaverhead River
-3.5	Ruby River
-3.2	Big Hole River
-3.1	Boulder River (Jefferson)
-2.8	Jefferson River
-2.4	Madison River
-2.8	Gallatin River
-2.7	Missouri River above Canyon Ferry
-1.9	Missouri River below Canyon Ferry
-1.5	Smith River
-1.4	Sun River
-2.5	Teton River
1.0	Birch/Dupuyer Creeks
-1.0	Marias River
0.7	Musselshell River
-0.3	Missouri River above Ft. Peck
0.1	Missouri River below Ft. Peck
1.0	Milk River
-2.9	Yellowstone River above Livingston
-3.7	Shields River
-3.1	Boulder River (Yellowstone)
-3.3	Stillwater River
-2.7	Rock/Red Lodge Creeks
-3.4	Clarks Fork River
-3.1	Yellowstone River above Bighorn River
-0.9	Bighorn River below Bighorn Lake
-2.1	Little Bighorn River
-2.0	Yellowstone River below Bighorn River
-2.4	Tongue River
-3.3	Powder River



# KOOTENAI RIVER BASIN in Montana as of June 1, 1994

Snowpack conditions in the Kootenai River Basin in Montana were extremely below average and in the Kootenai River Basin in British Columbia, Canada, were extremely below average. Snow water content in Montana was 88 percent below average and 54 percent below last year and in British Columbia, Canada, 77 percent below average and 32 percent below last year.

## Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Percent of Average
EAST KOOTENAI in B.C.	0	0	0
KOOTENAI MAINTSTEM in MT	7	46	12
TOBACCO	2	91	37
FISHER	1	0	0
YAAK	2	0	5
KOOTENAI in MT	7	46	12
KOOTENAI ab Bonners Ferry	7	46	12

Mountain precipitation during May, was 12 percent below average and 8 percent below last year. Water year precipitation, beginning October 1, 1993, was 30 percent below average and 7 percent below last year.

Lake Koocanusa storage, on the last day of May, was 25 percent above average and 34 percent above last year.

## Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	***** Usable Storage Last Year	***** Average
LAKE KOOCANUSA	5748.0	3989.0	2971.0	3186.0

Surface Water Supply Index (SWSI) was -1.7 for the Kootenai River at Ft. Steele (Kootenai in Canada); -3.4 for the Tobacco River; -3.3 for the Kootenai Ft. Steele to Libby Dam; -0.5 for the Kootenai River below Libby Dam; -3.7 for the Fisher River; and -3.4 for the Yaak River.

Streamflows, for the period June through July, are forecast to be 32 percent below average and 41 percent below last years forecasts.

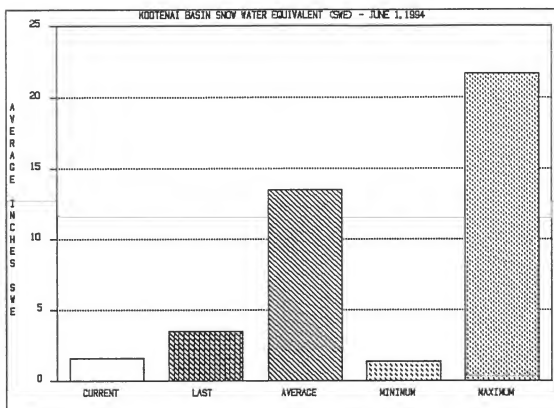
# Streamflow Forecasts

	← Drier — Future Conditions — Wetter →						
Forecast Pt Forecast Period	Chance of Exceeding *						30 Yr Avg
	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)		(1000AF)
<hr/>							
TOBACCO nr Eureka							
JUN-JUL	18.0	25	30	48	35	43	62
JUN-SEP	25	33	39	51	45	54	76
<hr/>							
KOOTENAI bl Libby Dam (1,2)							
JUN-JUL	1600	2210	2490	69	2770	3380	3633
JUN-SEP	2290	3010	3340	72	3670	4390	4626
<hr/>							
FISHER nr Libby							
JUN-JUL	16.0	22	29	41	38	50	70
JUN-SEP	27	34	40	47	49	63	86
<hr/>							
YAAK near Troy							
JUN-JUL	33	47	60	40	80	111	151
JUN-SEP	50	64	78	45	99	130	174
<hr/>							
KOOTENAI at Leonia (1,2)							
JUN-JUL	1680	2420	2760	69	3100	3840	4010
JUN-SEP	2340	3210	3610	71	4010	4880	5091

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1969-1993, OCCURRED IN WATER YEAR 1993.

MAXIMUM SNOW WATER EQUIVALENT, 1969-1993, OCCURRED IN WATER YEAR 1974.



# FLATHEAD RIVER BASIN as of June 1, 1994

Snowpack conditions in the Flathead River Basin were well below average. Snow water content was 68 percent below average and 36 percent below last year.

## Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Last Year	Percent of Average
NORTH FORK FLATHEAD	6	88	40
MIDDLE FORK FLATHEAD	4	173	53
SOUTH FORK FLATHEAD	2	21	15
STILLWATER-WHITEFISH	4	32	14
SWAN	6	43	29
MISSION VALLEY	4	49	33
LITTLE BITTERROOT-ASHLEY	1	0	0
JOCKO	3	36	14
FLATHEAD	18	64	33

Mountain precipitation during May, was 18 percent below average and 9 percent below last year. Water year precipitation, beginning October 1, 1993, was 23 percent below average and 9 percent below last year.

Reservoir storage, on the last day of May, was 16 percent below average and 5 percent above last year. Combined Camas reservoir storage was 26 percent below average and 3 percent above last year; the combined Mission Valley reservoir storage was 12 percent above average and 3 percent above last year; Hungry Horse storage was 31 percent below average and 9 percent below last year; and Flathead Lake storage was 10 percent above average and 1 percent above last year.

## Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
CAMAS (4)	45.2	22.9	22.3	31.1
MISSION VALLEY (8)	100.0	77.2	75.2	68.9
HUNGRY HORSE	3451.0	1847.0	1695.0	2659.0
FLATHEAD LAKE	1791.0	1622.0	1605.0	1480.0

Surface Water Supply Index (SWSI) was -3.4 for the North Fork Flathead River; -2.8 for the Middle Fork Flathead River; -3.5 for the South Fork Flathead River; -3.2 for the Flathead River at Columbia Falls; -3.4 for the Stillwater/Whitefish Rivers; -3.4 for the Swan River; -2.8 for the Flathead River at Polson; -1.5 for the Mission Valley; and -3.3 for the Little Bitterroot River.

Provisional streamflow data indicates the snowmelt peak flow for the North Fork Flathead River near Columbia Falls occurred on May 13 at 13,700 cfs and 35 percent below average and the Middle Fork Flathead River near West Glacier occurred on May 12 at 15,000 cfs and 33 percent below average.

Streamflows, for the period June through July, are forecast to be 38 percent below average and 16 percent above last years forecasts.

FLATHEAD RIVER BASIN  
Streamflow Forecasts - June 1, 1994

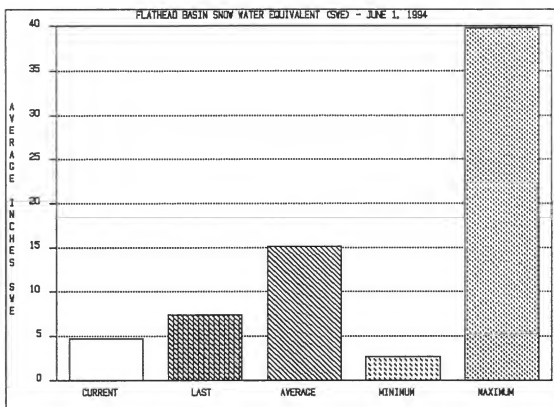
		<--- Drier --- Future Conditions --- Wetter --->						
Forecast Pt		Chance of Exceeding *						
Forecast		90%	70%	50% (Most Prob)	30%	10%		30 Yr Avg
Period		(1000AF)	(1000AF)	(1000AF) (% AVG.)	(1000AF)	(1000AF)		(1000AF)
<hr/>								
NF FLATHEAD	nr Columbia Falls							
JUN-JUL		470	540	590	68	640	710	872
JUN-SEP		600	680	735	70	790	870	1046
<hr/>								
MF FLATHEAD	nr West Glacier							
JUN-JUL		445	505	550	63	595	655	877
JUN-SEP		565	635	685	67	735	805	1027
<hr/>								
SF FLATHEAD	nr Columbia Fls (1,2)							
JUN-JUL		455	590	648	64	710	840	1019
JUN-SEP		550	690	750	65	810	950	1153
<hr/>								
FLATHEAD	at Columbia Falls (2)							
JUN-JUL		1540	1700	1810	64	1920	2080	2840
JUN-SEP		1870	2080	2214	67	2350	2560	3317
<hr/>								
STILLWATER	nr Whitefish							
JUN-JUL		32	40	45	55	50	58	82
JUN-SEP		46	54	60	59	66	74	101
<hr/>								
WHITEFISH	nr Kalispell							
JUN-JUL		22	25	27	47	29	32	58
JUN-SEP		30	33	36	51	39	42	71
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SWAN	nr Bigfork							
JUN-JUL		134	159	175	55	192	215	321
JUN-SEP		183	210	232	57	250	280	404
<hr/>								
FLATHEAD	nr Polson (1,2)							
JUN-JUL		1550	1880	2024	61	2170	2500	3315
JUN-SEP		1810	2230	2425	63	2620	3040	3850

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

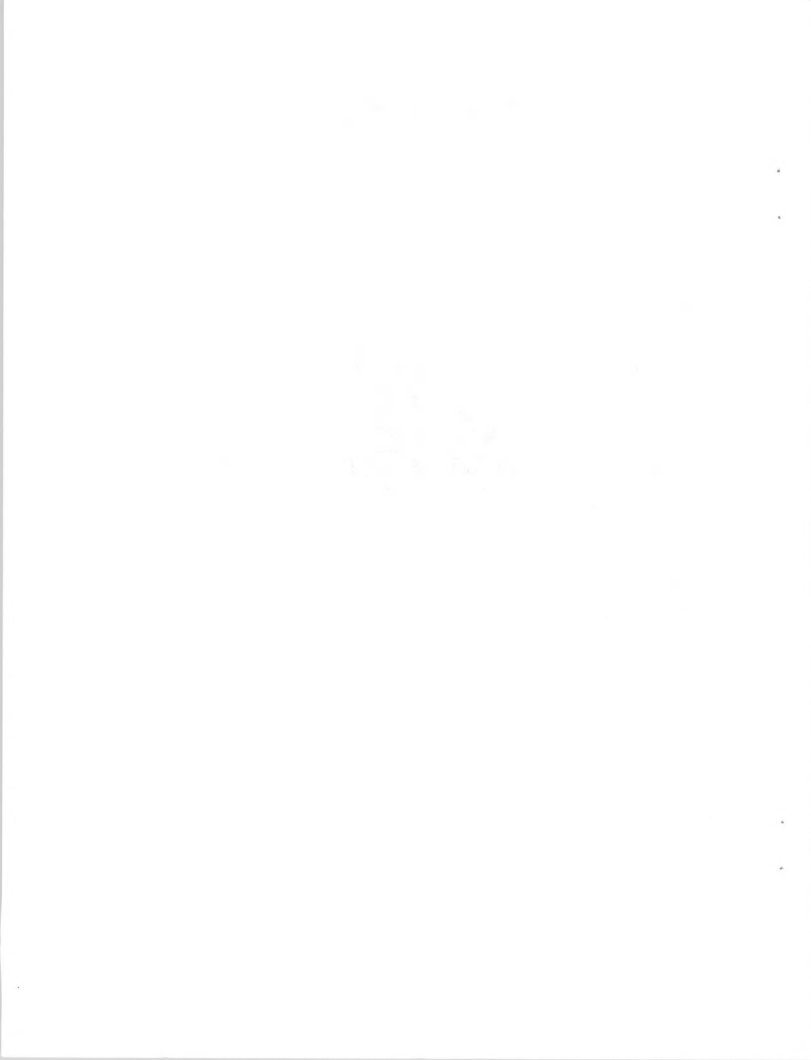




AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1992.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1972.



## UPPER CLARK FORK RIVER BASIN as of June 1, 1994

Snowpack conditions in the Upper Clark Fork River Basin were extremely below average. Snow water content was 89 percent below average and 61 percent below last year.

## Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Last Year	Percent of Average
CLARK FORK ab FLINT CREEK	6	50	16
FLINT CREEK	4	0	0
ROCK CREEK	2	0	0
CLARK FORK ab BLACKFOOT	11	41	11
BLACKFOOT	6	36	11
UPPER CLARK FORK	16	39	11

Mountain precipitation during May, was 20 percent below average and 5 percent below last year. Water year precipitation, beginning October 1, 1993, was 24 percent below average and 12 percent below last year.

Reservoir storage, on the last day of May, was 10 percent above average and 6 percent above last year. Georgetown Lake storage was 11 percent above average and 1 percent above last year; Lower Willow Creek was 16 percent above average; and Nevada Creek storage was 4 percent above average and 18 percent above last year.

## Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
GEORGETOWN LAKE	31.0	30.0	29.8	27.0
LOWER WILLOW CREEK	4.9	5.1	4.6	4.4
NEVADA CREEK	12.6	11.9	10.1	11.4

Surface Water Supply Index (SWSI) was -3.0 for the Clark Fork River above Rock Creek; -3.0 for the Blackfoot River; and -3.0 for the Clark Fork River above Missoula.

Provisional streamflow data indicates the snowmelt peak flow for the Blackfoot near Bonner occurred on May 13 at 5,270 cfs and 45 percent below average.

Streamflows, for the period June through July, are forecast to be 53 percent below average and 5 percent below last years forecasts.

# Streamflow Forecasts

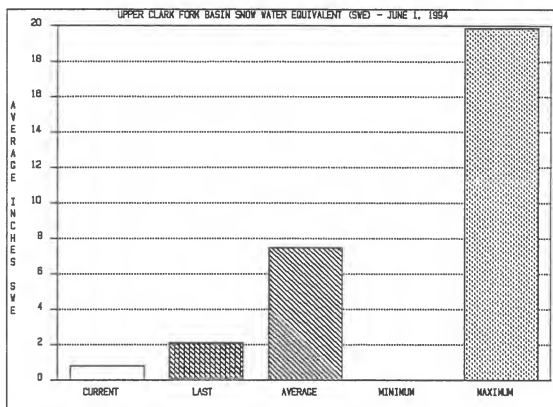
	← Drier      Future      Conditions      Wetter →						
Forecast Pt Forecast Period	Chance of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)	
MOULTON RES inflow (million gal.)							
JUN-JUN	8.0	11.0	14.0	23	26	43	60
JUN-JUL	12.0	17.0	22	27	38	61	82
WARM SPRINGS CK at Anaconda (2)							
JUN-JUL	11.0	11.0	12.0	45	15.0	20	26
JUN-SEP	16.0	17.0	17.0	49	21	27	35
LITTLE BLACKFOOT nr Garrison							
JUN-JUL	9.0	13.0	16.0	48	24	34	34
JUN-SEP	11.0	16.0	21	51	29	41	41
FLINT CK nr Southern Cross (2)							
JUN-JUL	2.2	2.8	3.3	41	4.6	6.5	8.0
JUN-SEP	4.0	4.2	4.4	42	6.2	8.9	10.6
FLINT CK bl Boulder Ck							
JUN-JUL	12.0	14.0	16.0	47	21	27	34
JUN-SEP	17.0	22	27	54	33	42	50
LOWER WILLOW CK RES inflow							
JUN-JUL	0.8	1.5	2.2	48	2.9	4.0	4.6
JUN-SEP	1.2	2.3	3.1	56	3.9	5.1	5.5
MF ROCK CK nr Philipsburg							
JUN-JUL	11.0	15.0	18.0	43	22	27	42
JUN-SEP	14.0	18.0	22	45	26	33	49
ROCK CK nr Clinton							
JUN-JUL	51	63	74	45	89	111	165
JUN-SEP	69	85	102	50	119	144	202
NEVADA CK nr Finn							
JUN-JUL	1.1	2.4	3.7	49	5.3	7.6	7.5
JUN-SEP	1.7	3.5	5.2	57	6.9	9.5	9.2
CLEARWATER nr Clearwater							
JUN-JUL	16.0	23	29	45	37	48	65
JUN-SEP	19.0	27	34	46	41	52	74
BLACKFOOT nr Bonner							
JUN-JUL	99	153	200	48	245	315	414
JUN-SEP	152	220	270	53	320	395	505

	<--- Drier --- Future Conditions --- Wetter --->						
Forecast Pt	Chance of Exceeding *						
Forecast	90%	70%	50% (Most Prob)	30%	10%		30 Yr Avg
Period	(1000AF)	(1000AF)	(1000AF) (% AVG.)	(1000AF)	(1000AF)		(1000AF)
CLARK FORK ab Milltown							
JUN-JUL	71	126	168	50	210	275	339
JUN-SEP	115	186	236	53	285	360	442
CLARK FORK ab Missoula							
JUN-JUL	199	300	368	49	435	535	753
JUN-SEP	315	430	506	53	585	700	947

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1970-1993, OCCURRED IN WATER YEAR 1987.

MAXIMUM SNOW WATER EQUIVALENT, 1970-1993, OCCURRED IN WATER YEAR 1972.

BITTERROOT RIVER BASIN as of June 1, 1994

Snowpack conditions in the Bitterroot River Basin were extremely below average. Snow water content was 99 percent below average and 96 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Last Year	Percent of Average
WEST FORK BITTERROOT	2	18	3
EAST SIDE BITTERROOT	2	0	0
WEST SIDE BITTERROOT	4	0	0
BITTERROOT	8	4	1

Mountain precipitation during May, was 10 percent below average and 15 percent above last year. Water year precipitation, beginning October 1, 1993, was 25 percent below average and 9 percent below last year.

Reservoir storage, on the last day of May, was 12 percent above average and 7 percent above last year. Painted Rocks Lake storage was 10 percent above average and the same as last year and Como storage was 14 percent above average and 15 percent above last year.

Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
PAINTED ROCKS LAKE	31.7	33.4	33.4	30.4
COMO	34.9	33.0	28.8	28.9

Surface Water Supply Index (SWSI) was -3.0 for the Bitterroot River.

Provisional streamflow data indicates the snowmelt peak flow for the Bitterroot River near Darby occurred on May 12 at 2,430 cfs and 61 percent below average.

Streamflows, for the period June through July, are forecast to be 73 percent below average and 48 percent below last years forecasts.

#### Streamflow Forecasts

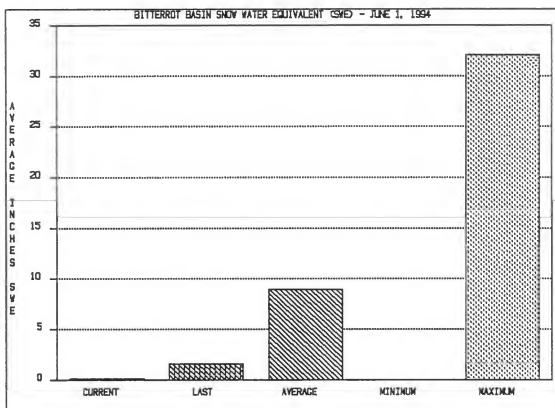
	◄--- Drier --- Future Conditions --- Wetter ►						
Forecast Pt Forecast Period	Chance of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)		30 Yr Avg (1000AF)
WF BITTERROOT nr Conner (2)							
JUN-JUL	15.0	16.0	17.0	22	26	41	75
JUN-SEP	23	24	25	28	36	53	89
BITTERROOT nr Darby							
JUN-JUL	60	63	65	25	91	130	262
JUN-SEP	90	93	96	31	125	166	311
ROCK CK nr Darby (2)							
JUN-JUL	13.0	17.0	21	49	25	31	43
JUN-SEP	16.0	21	25	53	29	36	47
SKALKAHO CK nr Hamilton							
JUN-JUL	10.0	10.0	11.0	37	13.0	16.0	29
JUN-SEP	14.0	15.0	16.0	44	18.0	22	36
BURNT FORK CK nr Stevensville (2)							
JUN-JUL	4.7	5.5	6.4	35	8.3	11.2	18.2
JUN-SEP	7.0	9.0	10.0	43	12.0	16.0	23
BITTERROOT at Missoula							
JUN-JUL	177	184	198	27	245	315	736
JUN-SEP	230	240	253	30	305	385	853

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.





AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1965-1993, OCCURRED IN WATER YEAR 1992.

MAXIMUM SNOW WATER EQUIVALENT, 1965-1993, OCCURRED IN WATER YEAR 1974.



LOWER CLARK FORK RIVER BASIN as of June 1, 1994

Snowpack conditions in the Lower Clark Fork River Basin were extremely below average. Snow water content was 88 percent below average and 52 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Percent of Average
UPPER CLARK FORK	16	39	11
BITTERROOT	8	4	1
LOWER CLARK FORK	7	48	12
CLARK FORK TOTAL	29	37	9
FLATHEAD	18	64	33
PEND OREILLE	45	57	21

Mountain precipitation during May, was 29 percent below average and 33 percent below last year. Water year precipitation, beginning October 1, 1993, was 31 percent below average and 12 percent below last year.

Noxon Rapids storage, on the last day of May, was 13 percent above average and 2 percent below last year.

Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
NOXON RAPIDS	335.0	316.1	323.6	279.6

Surface Water Supply Index (SWSI) was -3.0 for the Clark Fork River below Bitterroot River and -2.8 for the Clark Fork River below Flathead River.

Provisional streamflow data indicates the snowmelt peak flow for the Clark Fork below Missoula occurred on April 25 at 16,000 cfs and 50 percent below average and for the Clark Fork at St. Regis occurred on April 25 at 20,300 cfs and 49 percent below average.

Streamflows, for the period June through July, are forecast to be 53 percent below average and 14 percent below last years forecasts.

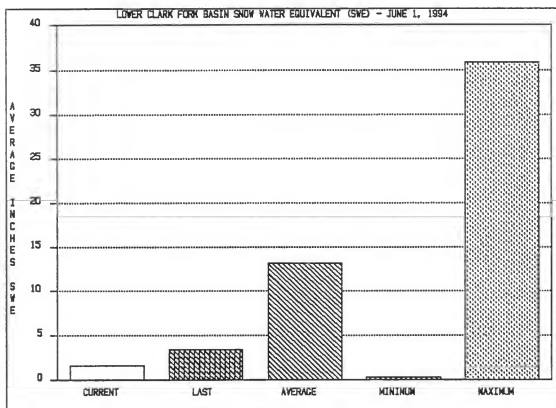
#### Streamflow Forecasts

	← Drier — Future Conditions — Wetter →						
Forecast Pt Forecast Period	Chance of Exceeding * 90% 70% 50% (Most Prob) 30% 10% (1000AF) (1000AF) (1000AF) (% AVG.) (1000AF) (1000AF)					30 Yr Avg (1000AF)	
CLARK FORK ab Missoula							
JUN-JUL	199	300	368	49	435	535	753
JUN-SEP	315	430	506	53	585	700	947
CLARK FORK bl Missoula							
JUN-JUL	385	475	566	38	670	820	1490
JUN-SEP	520	645	759	42	875	1050	1801
CLARK FORK at St. Regis (1)							
JUN-JUL	455	590	725	38	905	1300	1903
JUN-SEP	650	810	970	42	1170	1620	2313
CLARK FORK nr Plains (1,2)							
JUN-JUL	1910	2340	2750	50	3160	4070	5457
JUN-SEP	2400	2940	3395	52	3850	4860	6486
THOMPSON RIVER nr Thompson Falls							
JUN-JUL	23	28	34	38	43	57	89
JUN-SEP	38	45	53	46	64	79	116
PROSPECT CREEK at Thompson Falls							
JUN-JUL	13.0	14.0	15.0	34	20	28	44
JUN-SEP	18.0	20	22	42	28	36	53
CLARK FK at Whitehorse Rpds (1,2)							
JUN-JUL	1970	2470	2940	49	3410	4440	5984
JUN-SEP	2580	3140	3660	51	4180	5330	7166

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1966-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1966-1993, OCCURRED IN WATER YEAR 1974.



JEFFERSON RIVER BASIN as of June 1, 1994

Snowpack conditions in the Jefferson River Basin were extremely below average. Snow water content was 87 percent below average and 72 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Percent of Average
BEAVERHEAD	8	42	23
RUBY	4	0	0
BIGHOLE	7	52	22
BOULDER	3	51	12
JEFFERSON	17	28	13

Mountain precipitation during May, was 22 percent below average and 1 percent below last year. Water year precipitation, beginning October 1, 1993, was 26 percent below average and 20 percent below last year.

Reservoir storage, on the last day of May, was at average and 34 percent above last year. Lima storage was 14 percent above average and 19 percent above last year; Clark Canyon storage was 3 percent below average and 64 percent above last year; and Ruby River storage was 10 percent below average and 16 percent below last year.

Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
LIMA	84.0	72.9	61.3	64.2
CLARK CANYON	255.6	160.0	97.7	165.3
RUBY RIVER	38.8	34.2	40.7	37.9

Surface Water Supply Index (SWSI) was -2.4 for the Jefferson River; -1.4 for the Beaverhead River; -3.5 for the Ruby River; -3.2 for the Big Hole River; and -3.1 for the Boulder River.

Provisional streamflow data indicates the snowmelt peak flow for the Big Hole River near Melrose occurred on May 21 at 3,100 cfs and 61 percent below average.

Streamflows, for the period June through July, are forecast to be 71 percent below average and 59 percent below last years forecasts.

#### Streamflow Forecasts

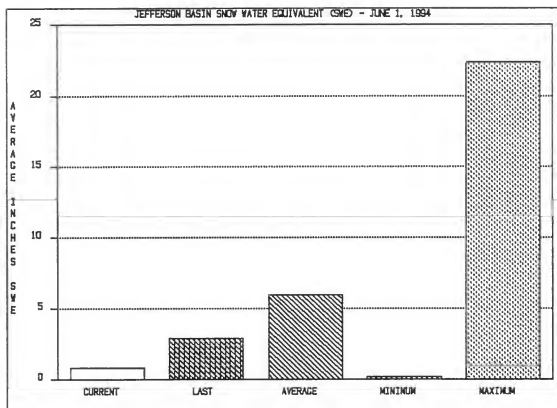
	<--- Drier --- Future Conditions --- Wetter --->						
Forecast Pt Forecast Period	Chance of Exceeding * 90% 70% 50% (Most Prob) 30% 10% (1000AF) (1000AF) (1000AF) (% AVG.) (1000AF) (1000AF)						30 Yr Avg (1000AF)
RED ROCK RIVER near Monida (2)							
JUN-JUL	4.0	6.0	13.0	33	19.0	28	39
JUN-SEP	5.0	9.0	14.0	29	23	35	47
BEAVERHEAD RIVER near Grant (2)							
JUN-JUL	-24.0	-9.0	1.0	3	12.0	27	52
JUN-SEP	-12.0	2.0	14.0	19	50	65	75
BEAVERHEAD RIVER at Barretts (2)							
JUN-JUL	-13.0	3.0	14.0	20	25	42	73
JUN-SEP	-6.0	19.0	35	34	52	76	104
RUBY RIVER near Alder							
JUN-JUL	15.0	18.0	20	44	28	40	45
JUN-SEP	23	27	32	52	43	58	61
BIG HOLE RIVER near Melrose							
JUN-JUL	95	134	161	46	188	225	349
JUN-SEP	123	169	200	49	230	275	406
BOULDER RIVER near Boulder							
JUN-JUL	6.0	14.0	19.0	48	24	32	40
JUN-SEP	7.0	17.0	24	52	31	41	46
WILLOW CREEK near Harrison							
JUN-JUL	0.6	0.8	1.0	9	3.3	6.6	10.8
JUN-SEP	1.0	1.3	1.6	12	4.8	9.6	13.0
JEFFERSON RIVER near Three Forks (2)							
JUN-JUL	14.0	46	79	17	132	210	459
JUN-SEP	11.0	61	112	20	186	295	551

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

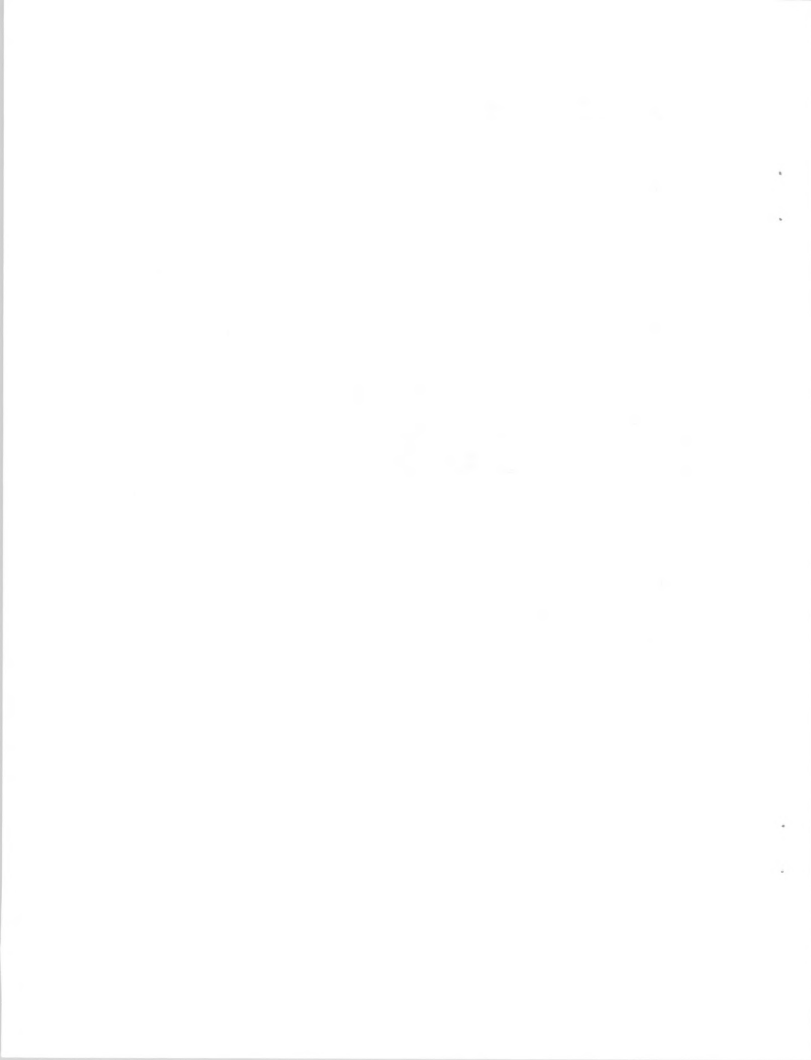




AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1975-1993, OCCURRED IN WATER YEAR 1987.

MAXIMUM SNOW WATER EQUIVALENT, 1975-1993, OCCURRED IN WATER YEAR 1975.



MADISON RIVER BASIN as of June 1, 1994

Snowpack conditions in the Madison River Basin were extremely below average. Snow water content was 92 percent below average and 91 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Last Year	Percent of Average
MADISON above HEBGEN	4	16	19
LOWER MADISON	5	0	0
MADISON	9	9	8

Mountain precipitation during May, was 11 percent below average and 5 percent below last year. Water year precipitation, beginning October 1, 1993, was 24 percent below average and 26 percent below last year.

Reservoir storage, on the last day of May, was 12 percent above average and 1 percent below last year. Ennis Lake storage was 4 percent above average and 4 percent above last year and Hebgen Lake storage was 13 percent above average and 2 percent below last year.

Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
ENNIS LAKE	41.0	37.4	36.1	35.8
HEBGEN LAKE	377.5	351.3	357.0	309.8

Surface Water Supply Index (SWSI) was -2.4 for the Madison River.

Streamflows, for the period June through July, are forecast to be 46 percent below average and 36 percent below last years forecasts.

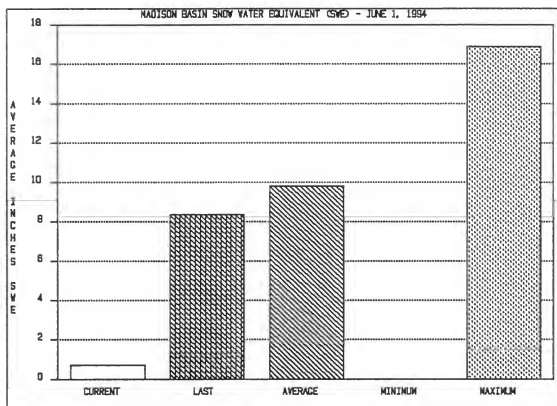
#### Streamflow Forecasts

Forecast Pt Forecast Period	<— Drier — Future Conditions — Wetter —>					30 Yr Avg (1000AF)	
	Chance of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)		
MADISON RIVER near Grayling (2)							
JUN-JUL	92	108	119	60	130	146	200
JUN-SEP	170	193	209	68	225	250	307
MADISON RIVER near McAllister (2)							
JUN-JUL	135	166	186	50	205	235	369
JUN-SEP	255	295	321	60	345	385	538

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1972-1993, OCCURRED IN WATER YEAR 1992.

MAXIMUM SNOW WATER EQUIVALENT, 1972-1993, OCCURRED IN WATER YEAR 1974.



# GALLATIN RIVER BASIN as of June 1, 1994

Snowpack conditions in the Gallatin River Basin were extremely below average. Snow water content was 92 percent below average and 89 percent below last year.

## Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Percent of Average
UPPER GALLATIN	4	14	10
EAST GALLATIN	4	3	2
GALLATIN	7	11	8

Mountain precipitation during May, was 38 percent below average and 37 percent below last year. Water year precipitation, beginning October 1, 1993, was 30 percent below average and 29 percent below last year.

Middle Creek storage, on the last day of May, was 46 percent above average and 23 percent above last year. Note: Middle Creek storage was increased by 2,200 acre-feet during the fall of 1993, therefore the percent of average is reflecting the new capacity with averages prior to the additional storage.

## Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
MIDDLE CREEK	10.2	10.2	8.3	7.0

Surface Water Supply Index (SWSI) was -2.8 for the Gallatin River.

Provisional streamflow data indicates the snowmelt peak flow for the Gallatin River near Gallatin Gateway occurred May 13 at 3,770 cfs and 30 percent below average and for the Gallatin River near Logan occurred May 13 at 3,010 and 46 percent below average.

Streamflows, for the period June through July, are forecast to be 46 percent below average and 38 percent below last years forecasts.

#### Streamflow Forecasts

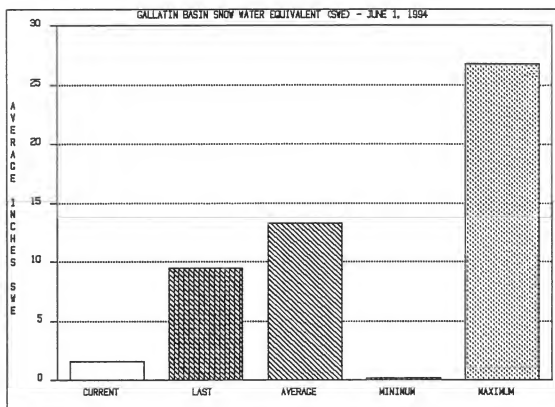
	<--- Drier --- Future Conditions --- Wetter --->						
Forecast Pt Forecast Period	Chance of Exceeding *						30 Yr Avg (1000AF)
	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)		
GALLATIN RIVER near Gateway							
JUN-JUL	133	154	168	57	182	205	294
JUN-SEP	189	215	230	62	245	270	371
E & W FK HYALITE CRREK near Bozeman (2)							
JUN-JUL	6.1	8.1	9.5	59	10.9	12.9	21
JUN-SEP	8.3	10.6	12.2	63	13.8	16.1	25
HYALITE CREEK near Bozeman (2)							
JUN-JUL	7.0	10.0	13.0	58	15.0	19.0	22
JUN-SEP	11.0	15.0	18.0	63	20	24	28
GALLATIN RIVER at Logan							
JUN-JUL	59	108	141	49	174	225	287
JUN-SEP	115	171	208	56	245	300	370

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

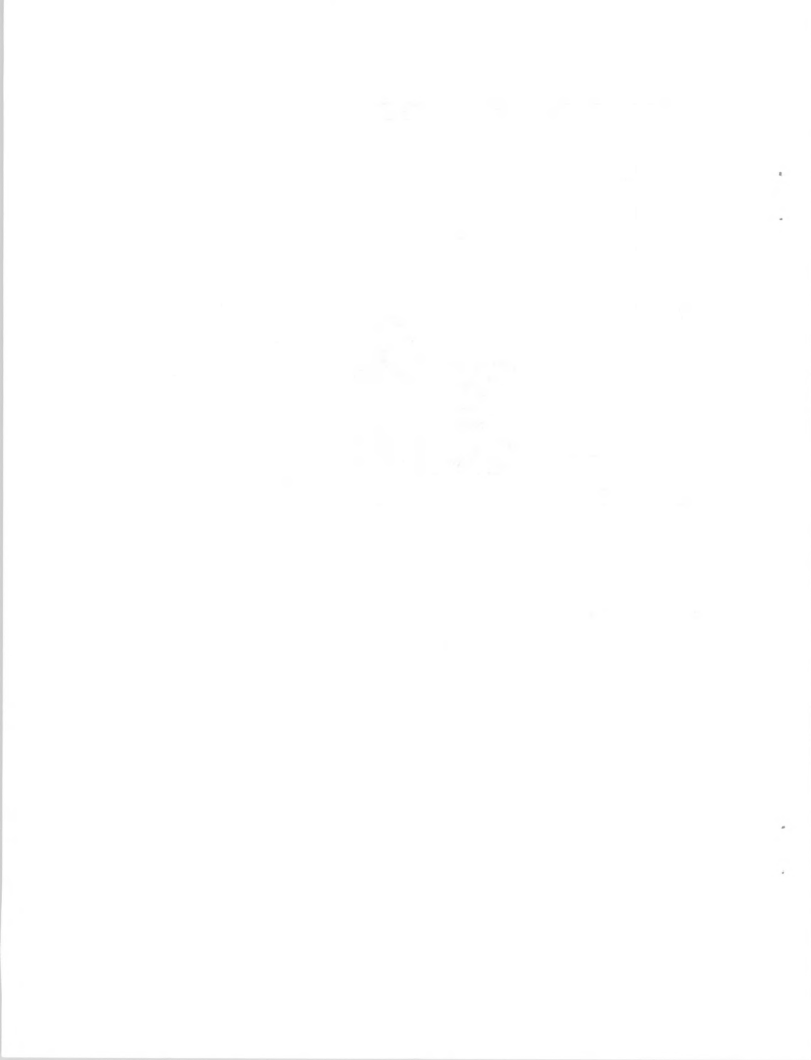




AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1963-1993, OCCURRED IN WATER YEAR 1987.

MAXIMUM SNOW WATER EQUIVALENT, 1963-1993, OCCURRED IN WATER YEAR 1975.



# MAINSTEM MISSOURI RIVER BASIN as of June 1, 1994

Snowpack conditions in the Mainstem Missouri River Basin were extremely below average. Snow water content was 84 percent below average and 113 percent above last year.

## Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
MISSOURI HEADWATERS	29	17	12
WEST SIDE MISSOURI	3	0	0
SMITH-BELT	4	23	4
MAINSTEM MISSOURI	18	213	16
SUN-TETON-MARIAS	6	707	27
JUDITH-MUSSELSHELL	3	24	6
MISSOURI above FORT PECK	41	22	12
MILK RIVER	5	0	0
MISSOURI in MONTANA	45	22	11
MISSOURI blw YELLOWSTONE	88	19	10

Mountain precipitation during May, was 31 percent below average and 24 percent below last year. Water year precipitation, beginning October 1, 1993, was 20 percent below average and 13 percent below last year.

Reservoir storage, on the last day of May, was 2 percent above average and 6 percent below last year. Canyon Ferry Lake storage was 2 percent above average and 7 percent below last year; Helena Valley storage was 22 percent above average and 13 percent above last year; Lake Helena storage was 6 percent above average and 2 percent below last year; Hauser & Helena storage was 3 percent above average and 1 percent below last year; Holter Lake storage was 4 percent above average and the same as last year; and Fort Peck Lake storage was 3 percent above average and 44 percent above last year.

## Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
CANYON FERRY LAKE	2043.0	1697.0	1820.0	1659.0
HELENA VALLEY	9.2	8.9	7.9	7.3
LAKE HELENA	10.4	10.7	10.9	10.1
HAUSER & HELENA	61.9	62.5	63.1	60.9
HOLTER LAKE	81.9	80.9	81.0	78.0
FORT PECK LAKE (MAF)	18.9	16.0	11.1	15.5

Surface Water Supply Index (SWSI) was -2.7 for the Missouri River above Canyon Ferry; -1.9 for the Missouri River below Canyon Ferry; -0.3 for the Missouri River above Ft. Peck; and 0.1 for the Missouri River below Ft. Peck.

Provisional streamflow data indicates the snowmelt peak flow for the Missouri River near Toston occurred April 26 at 8,490 cfs and 55 percent below average.

Streamflows, for the period June through July, are forecast to be 48 percent below average and 25 percent below last years forecasts.

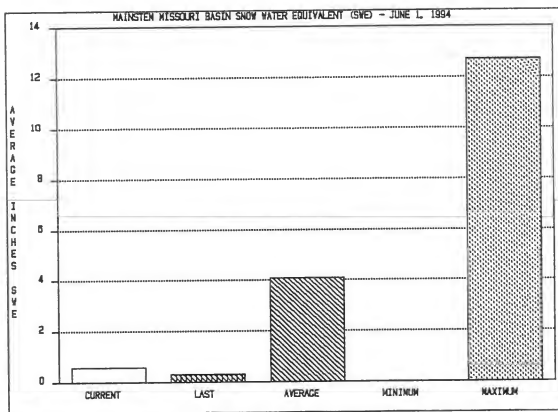
#### Streamflow Forecasts

Forecast Pt Forecast Period	<--- Drier --- Future Conditions --- Wetter --->						30 Yr Avg (1000AF)
	90% (1000AF)	70% (1000AF)	Chance of Exceeding *		30% (1000AF)	10% (1000AF)	
			50% (Most Prob) (1000AF)	(% AVG.)			
MISSOURI RIVER at Toston (2)							
JUN-JUL	280	360	424	38	520	655	1120
JUN-SEP	380	520	641	44	760	940	1461
PRICKLY PEAR CREEK near Clancy							
JUN-JUL	3.4	4.8	6.2	52	9.0	13.1	12.0
JUN-SEP	5.8	7.6	9.3	59	12.8	17.9	15.8
SUN RIVER at Gibson Dam (2)							
JUN-JUL	142	182	210	75	240	280	281
JUN-SEP	185	225	255	78	285	325	329
MISSOURI RIVER at Fort Benton (2)							
JUN-JUL	470	630	865	52	1100	1450	1671
JUN-SEP	700	985	1280	57	1580	2010	2262
MARIAS RIVER near Shelby (2)							
JUN-JUL	61	125	168	71	210	275	236
JUN-SEP	91	153	194	70	235	295	277
MISSOURI RIVER at Virgelle (2)							
JUN-JUL	505	775	1055	54	1440	2000	1942
JUN-SEP	770	1130	1490	58	1900	2500	2564
MISSOURI RIVER near Landusky (2)							
JUN-JUL	610	885	1170	55	1570	2170	2109
JUN-SEP	865	1260	1650	59	2040	2610	2792
MISSOURI RIVER below Fort Peck (2)							
JUN-JUL	520	830	1135	55	1580	2230	2072
JUN-SEP	625	995	1360	55	1770	2370	2490
LAKE SAKAKAWEA Inflow (2)							
JUN-JUL	1610	2370	2880	52	3390	3990	5540
JUN-SEP	2050	3040	3710	53	4380	5370	6989

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1979-1993, OCCURRED IN WATER YEAR 1985 & 1992.

MAXIMUM SNOW WATER EQUIVALENT, 1979-1993, OCCURRED IN WATER YEAR 1982.

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SMITH-JUDITH-MUSSELSHELL RIVER BASINS as of June 1, 1994

Snowpack conditions in the Smith-Judith-Musselshell River Basins were extremely below average. Snow water content was 97 percent below average and 77 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Last Year	Percent of Average
SMITH-BELT	4	23	4
JUDITH-MUSSELSHELL	3	24	6

Mountain precipitation during May, was 53 percent below average and 49 percent below last year. Water year precipitation, beginning October 1, 1993, was 18 percent below average and 11 percent below last year.

Reservoir storage, on the last day of May, was 26 percent above average and 12 percent above last year. Smith River storage was 10 percent above average and 14 percent above last year; Newlan Creek storage was 31 percent above average; Bair storage was 13 percent above average and 1 percent below last year; Martinsdale storage was 37 percent above average and 2 percent below last year; and Deadman's Basin was 27 percent above average and 1 percent below last year.

Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
SMITH RIVER	10.6	11.5	10.1	10.5
NEWLAN CREEK	12.4	12.6	----	9.6
BAIR	7.0	7.0	7.1	6.2
MARTINSDALE	23.1	23.6	24.0	17.2
DEADMAN'S BASIN	72.2	69.9	70.4	55.1

Surface Water Supply Index (SWSI) was -1.5 for the Smith River and 0.7 for the Musselshell River.

Streamflows, for the period June through July, are forecast to be 28 percent below average and 15 percent below last years forecasts.

#### Streamflow Forecasts

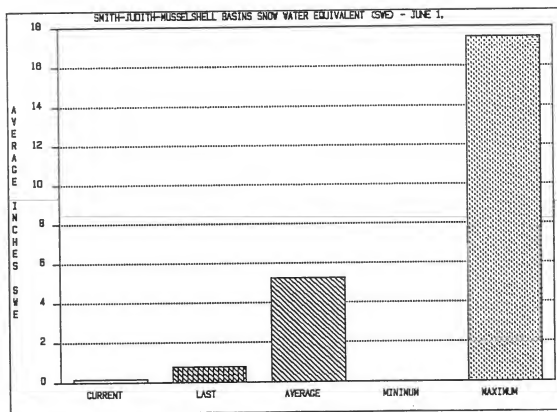
	<div>&lt;— Drier —      Future    Conditions    — Wetter —&gt;</div>						
Forecast Pt	Chance of Exceeding *						
Forecast	90%	70%	50% (Most Prob)	30%	10%		30 Yr Avg
Period	(1000AF)	(1000AF)	(1000AF) (% AVG.)	(1000AF)	(1000AF)		(1000AF)
<hr/>							
SMITH RIVER near Fort Logan							
JUN-JUL	21	26	29	81	32	37	36
JUN-SEP	31	36	39	83	42	47	47
<hr/>							
SHEEP CREEK nr White Sulphur Springs							
JUN-JUL	4.5	6.9	8.5	85	10.1	12.5	10.0
JUN-SEP	6.9	9.6	11.4	88	13.2	15.9	12.9
<hr/>							
NF MUSSELSHELL near Delpine							
JUN-JUL	0.7	1.3	1.8	78	2.3	2.9	2.3
JUN-SEP	1.0	1.9	2.5	81	3.1	4.0	3.1
<hr/>							
SF MUSSELSHELL abv Martinsdale							
JUN-JUL	2.0	7.0	14.0	53	21	31	26
JUN-SEP	2.0	9.0	16.0	56	24	35	29

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

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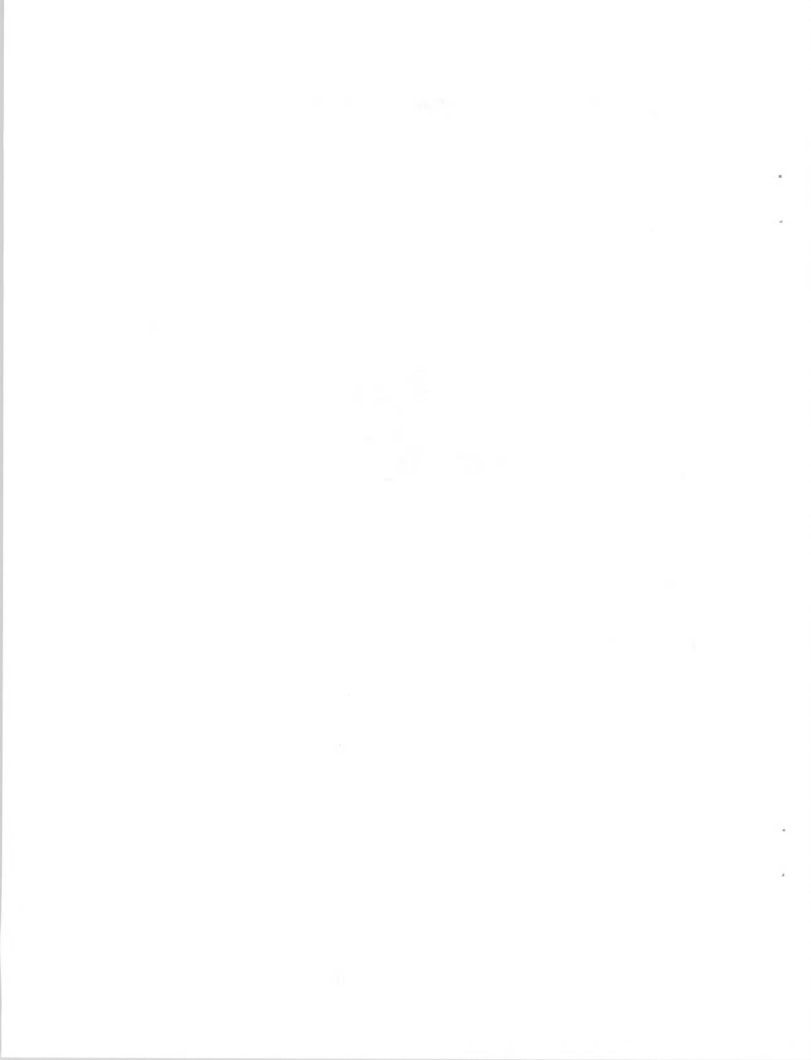




AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1965-1993, OCCURRED IN WATER YEAR 1992.

MAXIMUM SNOW WATER EQUIVALENT, 1965-1993, OCCURRED IN WATER YEAR 1970.



SUN-TETON-MARIAS RIVER BASINS as of June 1, 1994

Snowpack conditions in the Sun-Teton-Marias River Basins were extremely below average. Snow water content was 73 percent below average and 607 percent above last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Last Year	Percent of Average
SUN-TETON	3	0	1
MARIAS	3	700	36
SUN-TETON-MARIAS	6	707	27

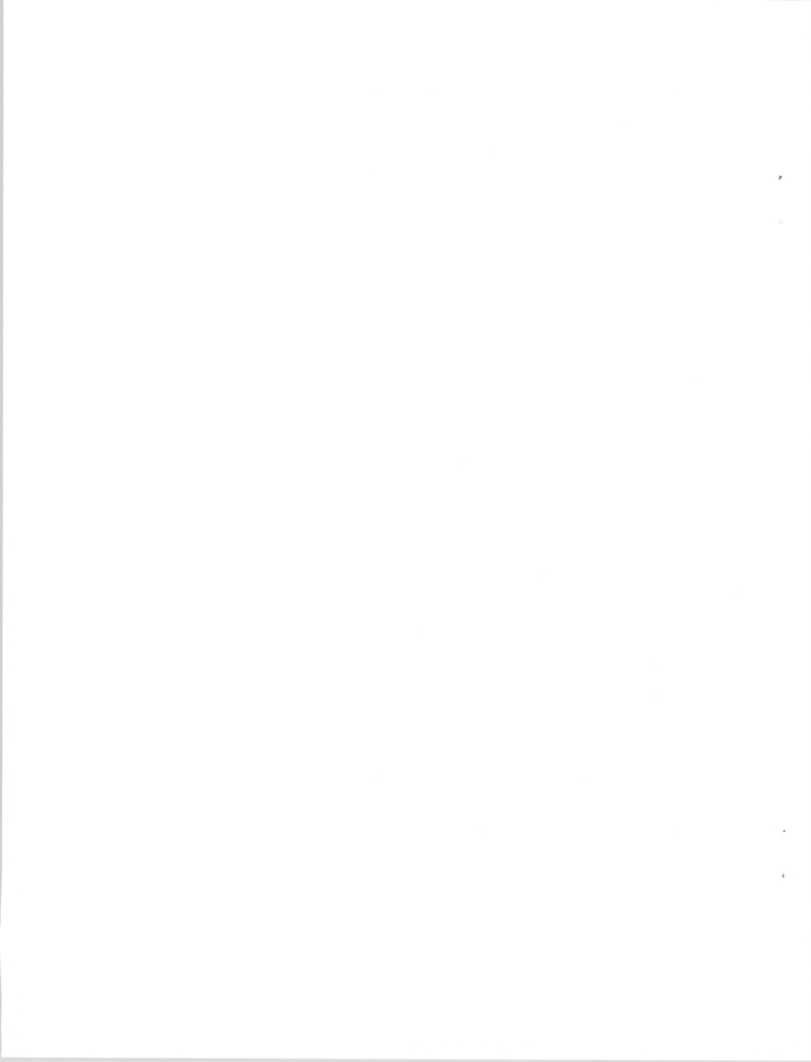
Mountain precipitation for May, was 4 percent below average and 11 percent below last year. Water year precipitation, beginning October 1, 1993, was 15 percent below average and 3 percent above last year.

Reservoir storage, on the last day of May, was 27 percent above average and 12 percent above last year. Gibson storage was 3 percent above average and 5 percent below last year; Pishkun storage was 6 percent below average and 4 percent below last year; Willow Creek storage was 9 percent above average and 16 percent above last year; Lower Two Medicine Lake storage was 19 percent above average and 6 percent above last year; Four Horns Lake storage was 2 percent above average and 2 percent below last year; Swift storage was 21 percent above average and 46 percent above last year; Lake Frances storage was 19 percent above average and 60 percent above last year; and Lake Elwell (Tiber) storage was 34 percent above average and 10 percent above last year.

Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
GIBSON	99.1	92.9	97.9	90.1
PISHKUN	32.0	28.4	29.5	30.1
WILLOW CREEK	32.2	31.0	26.8	28.5
LOWER TWO MEDICINE LAKE	11.9	13.2	12.5	11.1
FOUR HORNS LAKE	19.2	13.2	13.4	13.0
SWIFT	30.0	30.0	20.6	24.8
LAKE FRANCES	112.0	104.1	65.1	87.4
LAKE ELWELL (TIBER)	1347.0	924.5	839.3	690.8

Surface Water Supply Index (SWSI) was -1.4 for the Sun River; -2.5 for the Teton River; -1.0 for the Marias River; and 1.0 for the Birch/Dupuyer Creeks.





Provisional streamflow data indicates the snowmelt peak flow for the Marias River near Shelby occurred on May 21 at 4,550 cfs and 60 percent below average.

Streamflows, for the period June through July, are forecast to be 26 percent below average and 70 percent above last years forecasts.

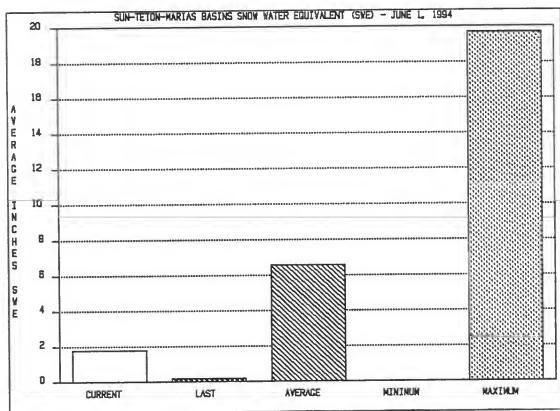
#### Streamflow Forecasts

	<div>&lt;--- Drier ---      Future Conditions      --- Wetter --&gt;</div>						
Forecast Pt Forecast Period	Chance of Exceeding * 90%      70%      50% (Most Prob)      30%      10% (1000AF)    (1000AF)    (1000AF) (% AVG.)    (1000AF)    (1000AF)						30 Yr Avg (1000AF)
SUN RIVER at Gibson Dam (2)							
JUN-JUL	142	182	210	75	240	280	281
JUN-SEP	185	225	255	78	285	325	329
TWO MEDICINE RIVER near Browning (2)							
JUN-JUL	27	52	78	74	104	142	105
JUN-SEP	36	63	90	77	117	156	117
BADGER CREEK near Browning (2)							
JUN-JUL	17.0	33	43	75	53	69	57
JUN-SEP	29	45	56	76	67	83	74
SWIFT RESERVOIR Inflow near Dupuyer							
JUN-JUL	11.0	22	29	76	36	47	38
JUN-SEP	19.0	31	39	78	47	59	50
DUPUYER CREEK near Valier							
JUN-JUL	0.6	2.2	6.0	79	9.8	15.4	7.6
JUN-SEP	0.9	3.6	7.8	82	12.0	18.2	9.5
CUT BANK CREEK at Cut Bank							
JUN-JUL	21	30	36	77	42	51	47
JUN-SEP	30	39	45	80	51	60	56
MARIAS RIVER near Shelby (2)							
JUN-JUL	61	125	168	71	210	275	236
JUN-SEP	91	153	194	70	235	295	277

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

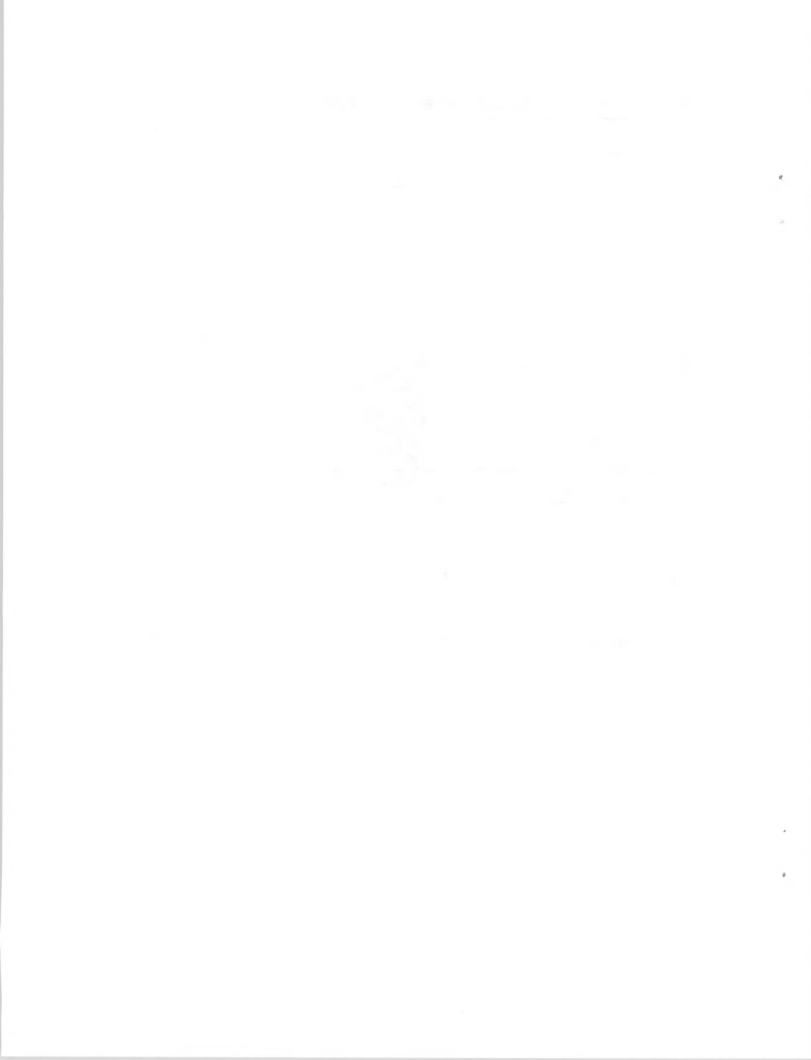
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AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1975-1993, OCCURRED IN WATER YEAR 1992.

MAXIMUM SNOW WATER EQUIVALENT, 1975-1993, OCCURRED IN WATER YEAR 1982.





ST. MARY and MILK RIVER BASINS as of June 1, 1994

Snowpack conditions in the St. Mary River Basin were well below average and in the Milk River Basin were extremely below average. Snow water content in the St. Mary was 44 percent below average and 28 percent above last year and snow water content in the Milk was melted out, as was last year at this time.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Percent of Average
MILK HEADWATERS	1	0	0
BEAR PAW	4	0	0
MILK RIVER	5	0	0
ST. MARY	2	128	54
ST. MARY and MILK	6	128	53
BOW RIVER in ALBERTA	0	0	0
OLDMAN RIVER in ALBERTA	0	0	0

Mountain precipitation for May, was 34 percent below average and 20 percent below last year. Water year precipitation, beginning October 1, 1993, was 17 percent below average and 2 percent above last year.

Reservoir storage, on the last day of May, was 32 percent above average and 56 percent above last year. Lake Sherburne storage was 87 percent above average and 69 percent above last year; Fresno storage was 14 percent above average and 39 percent above last year; Beaver Creek storage was 17 percent above average and 3 percent above last year; and Nelson storage was 31 percent above average and 90 percent above last year.

Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
LAKE SHERBURNE	64.3	59.9	35.4	32.0
FRESNO	127.0	101.3	73.0	89.1
BEAVER CREEK	3.5	3.4	3.3	2.9
NELSON	66.8	55.8	29.4	42.6

Surface Water Supply Index (SWSI) was 1.0 for the Milk River.

Streamflows in the St. Mary River Basin, for the period June through July, are forecast to be 32 percent below average and 23 percent above last years forecasts and in the Milk River Basin, for the period June through July, are forecast to be 81 percent below average.

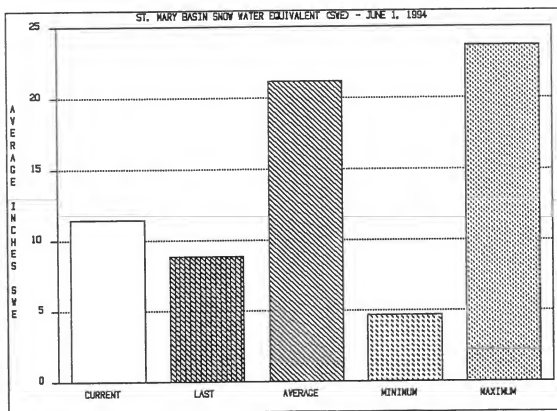
#### Streamflow Forecasts

	<--- Drier --- Future Conditions --- Wetter --->						
Forecast Pt	Chance of Exceeding *						
Forecast	90%	70%	50% (Most Prob)	30%	10%		
Period	(1000AF)	(1000AF)	(1000AF) (% AVG.)	(1000AF)	(1000AF)		30 Yr Avg (1000AF)
SWIFTCURRENT CREEK at Sherburne (2)							
JUN-JUL	31	38	42	66	46	53	64
JUN-SEP	44	52	57	70	62	70	81
ST. MARY RIVER near Babb							
JUN-JUL	159	171	180	69	189	200	261
JUN-SEP	205	225	238	72	250	275	329
MILK RIVER at Western Crossing							
JUN-JUL	0.5	2.6	5.1	43	7.6	11.3	12.0
JUN-SEP	0.6	3.8	6.9	46	10.0	14.6	15.0
MILK RIVER at Eastern Crossing							
JUN-JUL	-11.5	-4.6	0.1	1	4.8	11.7	16.0
JUN-SEP	-5.0	0.0	6.0	23	16.0	30	24

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

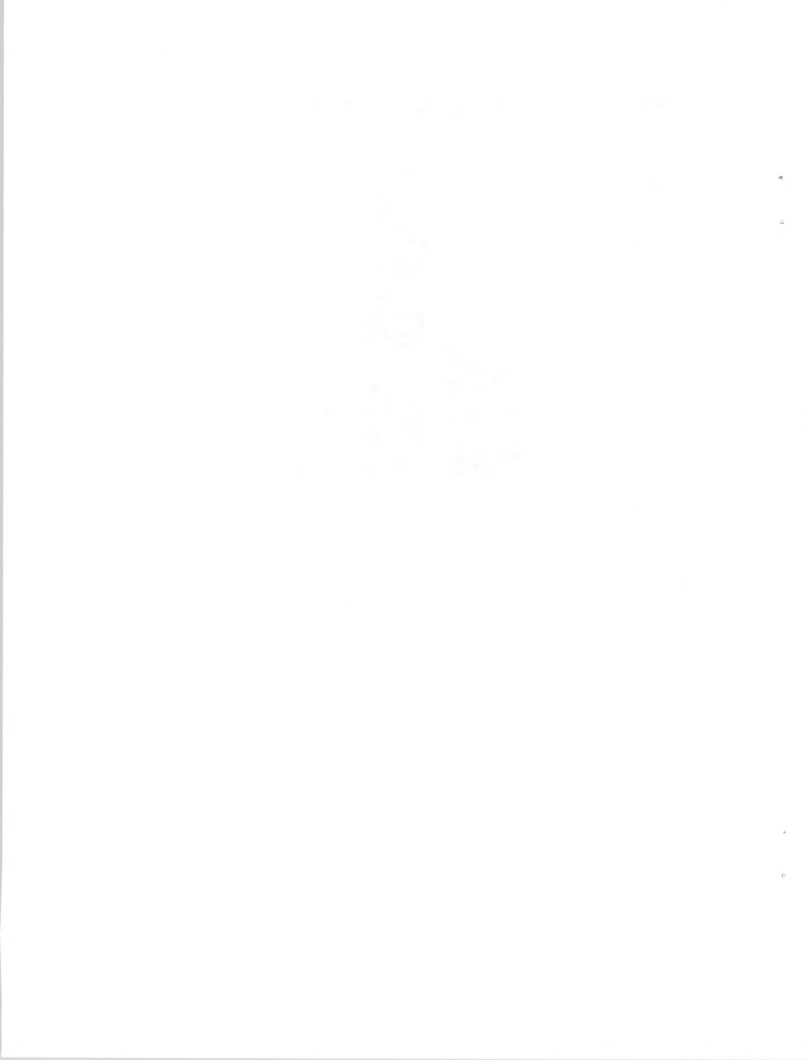
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AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1977-1993, OCCURRED IN WATER YEAR 1992.

MAXIMUM SNOW WATER EQUIVALENT, 1977-1993, OCCURRED IN WATER YEAR 1982.



## UPPER YELLOWSTONE RIVER BASIN as of June 1, 1994

Snowpack conditions in the Upper Yellowstone River Basin were extremely below average. Snow water content was 91 percent below average and 87 percent below last year.

## Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Last Year	Percent of Average
YELLOWSTONE ab LIVINGSTON	10	10	7
SHIELDS	4	0	0
BOULDER-STILLWATER	3	15	12
CLARK'S FORK-ROCK CREEK	9	17	11
UPPER YELLOWSTONE above BIGH	22	13	9

Mountain precipitation for May, was 36 percent below average and 34 percent below last year. Water year precipitation, beginning October 1, 1993, was 23 percent below average and 18 percent below last year.

Reservoir storage, on the last day of May, was 28 percent above average and 1 percent below last year. Mystic Lake storage was 76 percent above average and 28 percent above last year and Cooney storage was 14 percent above average and 10 percent below last year.

## Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
MYSTIC LAKE	21.0	9.7	7.6	5.5
COONEY	27.4	22.9	25.4	20.0

Surface Water Supply Index (SWSI) was -3.1 for the Yellowstone River above Bighorn River; -2.9 for the Yellowstone River above Livingston; -3.7 for the Shields River; -3.1 for the Boulder River; -3.3 for the Stillwater River; -2.7 for the Rock/Red Lodge Creeks; and -3.4 for the Clarks Fork River.

Provisional streamflow data indicates the snowmelt peak flow for the Yellowstone River at Corwin Springs occurred on May 13 at 14,400 cfs and 18 percent below average; and the Yellowstone River at Billings on May 14 at 28,600 cfs and 33 percent below average.

Streamflows, for the period June through July, are forecast to be 53 percent below average and 31 percent below last years forecasts.

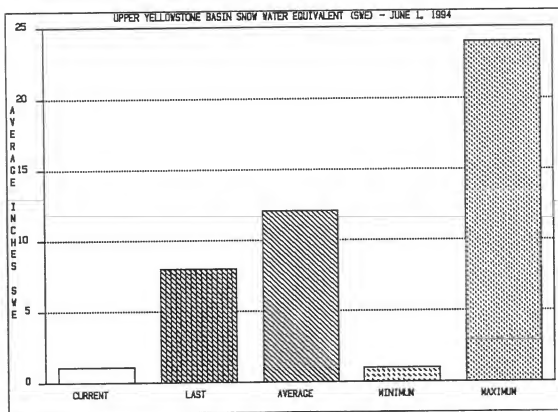
# Streamflow Forecasts

Forecast Pt Forecast Period	<--- Drier --- Future Conditions --- Wetter --->						30 Yr Avg (1000AF)
	Chance of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)		
YELLOWSTONE at Lake Outlet							
JUN-JUL	155	200	230	49	260	305	472
JUN-SEP	270	325	360	52	395	450	691
YELLOWSTONE RIVER at Corwin Springs							
JUN-JUL	440	510	555	48	600	670	1156
JUN-SEP	590	685	750	51	815	910	1484
YELLOWSTONE RIVER near Livingston							
JUN-JUL	470	565	628	47	695	790	1335
JUN-SEP	665	785	864	50	945	1060	1721
SHIELDS RIVER near Livingston							
JUN-JUL	26	43	54	70	65	82	77
JUN-SEP	36	55	68	72	81	100	95
BOULDER RIVER at Big Timber							
JUN-JUL	76	89	100	40	115	137	253
JUN-SEP	93	102	113	40	132	161	282
WEST ROSEBUD CREEK near Roscoe (2)							
JUN-JUL	29	30	32	63	36	41	51
JUN-SEP	40	43	46	67	50	56	69
STILLWATER RIVER nr Absarokee (2)							
JUN-JUL	160	167	174	46	195	225	380
JUN-SEP	205	215	230	48	260	305	475
CLARKS FORK RIVER near Belfry							
JUN-JUL	154	195	222	56	250	290	395
JUN-SEP	205	250	282	62	315	360	453
RED LODGE CREEK blw Cooney Res (2)							
JUN-JUL	0.0	6.0	10.0	43	15.0	21	24
JUN-SEP	5.0	15.0	22	63	29	39	35
YELLOWSTONE RIVER at Billings (2)							
JUN-JUL	785	960	1150	46	1340	1610	2525
JUN-SEP	1010	1250	1490	47	1730	2070	3159

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

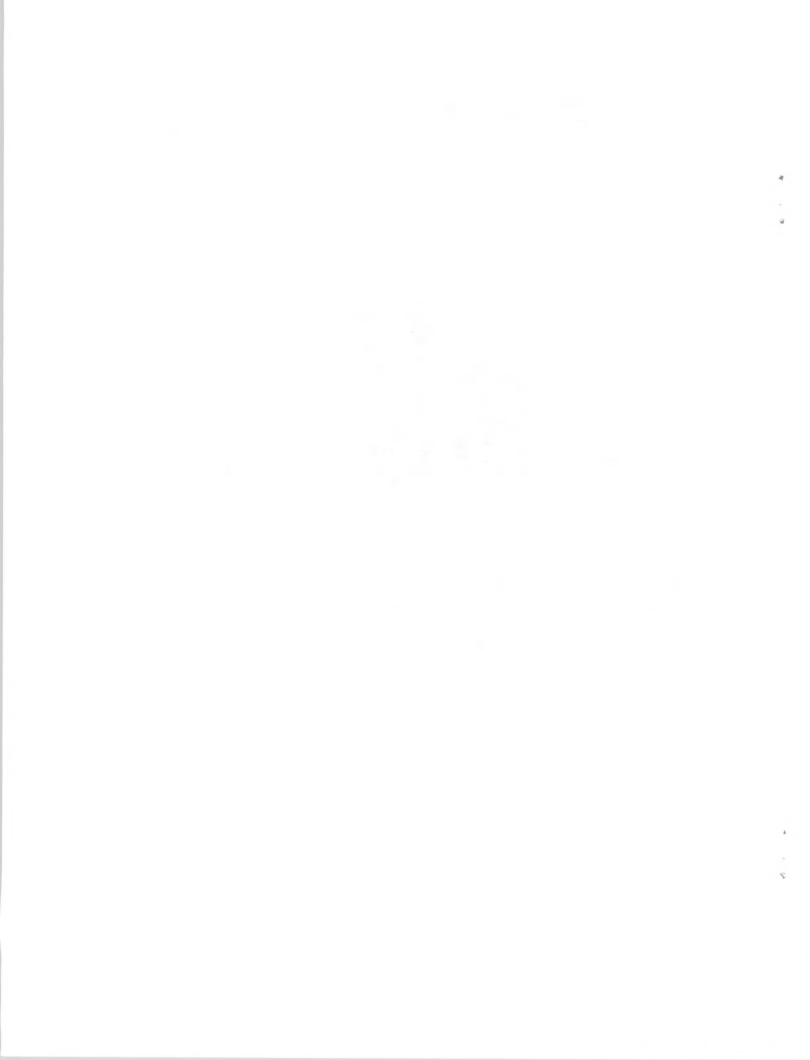
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AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1974-1993, OCCURRED IN WATER YEAR 1987.

MAXIMUM SNOW WATER EQUIVALENT, 1974-1993, OCCURRED IN WATER YEAR 1974.





# LOWER YELLOWSTONE RIVER BASIN as of June 1, 1994

Snowpack conditions in the Lower Yellowstone River Basin were extremely below average. Snow water content was 91 percent below average and 80 percent below last year.

## Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Percent of Average
WIND RIVER (Wyoming)	10	14	6
BIGHORN RIVER (Wyoming)	15	23	11
LITTLE BIGHORN	2	62	26
TONGUE RIVER (Wyoming)	5	0	0
POWDER RIVER (Wyoming)	6	0	0
YELLOWSTONE RIVER	46	14	8

Mountain precipitation for May, was 66 percent below average and 71 percent below last year. Water year precipitation, beginning October 1, 1993, was 8 percent below average and 3 percent below last year.

Reservoir storage, on the last day of May, was at average and 10 percent below last year. Bighorn Lake storage was at average and 10 percent below last year and the Tongue River storage was 5 percent below average and 2 percent above last year.

## Reservoir Storage (1000AF) End of May

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
BIGHORN LAKE	1356.0	859.6	958.1	855.6
TONGUE RIVER	68.0	45.7	45.0	48.2

Surface Water Supply Index (SWSI) was -2.0 for the Yellowstone River below Bighorn River; -0.9 for the Bighorn River below Bighorn Lake; -2.1 for the Little Bighorn River; -2.4 for the Tongue River; and -3.3 for the Powder River.

Streamflows, for the period June through July, are forecast to be 48 percent below average and 26 percent below last years forecasts.

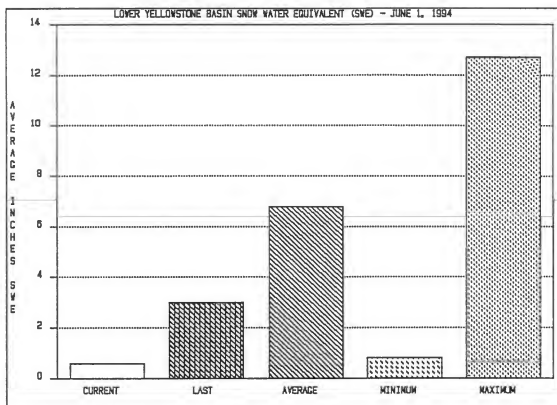
#### Streamflow Forecasts

Forecast Pt Forecast Period	<--- Drier --- Future Conditions --- Wetter --->					30 Yr Avg (1000AF)
	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)	
YELLOWSTONE RIVER at Billings (2)						
JUN-JUL	785	960	1150	46	1340	2525
JUN-SEP	1010	1250	1490	47	1730	3159
BIGHORN RIVER nr St. Xavier (2)						
JUN-JUL	365	525	630	55	735	1141
JUN-SEP	425	625	760	58	895	1306
LITTLE BIGHORN RIVER nr Hardin						
JUN-JUL	13.0	35	50	67	65	75
JUN-SEP	20	45	62	67	79	92
TONGUE RIVER near Decker (2)						
JUN-JUL	41	63	78	59	93	132
JUN-SEP	35	66	87	56	108	156
YELLOWSTONE RIVER at Miles City (2)						
JUN-JUL	850	1490	1930	51	2370	3753
JUN-SEP	1010	1850	2420	52	2990	4631
POWDER RIVER at Moorhead						
JUN-JUL	39	59	73	63	87	116
JUN-SEP	47	76	96	70	116	138
POWDER RIVER near Locate						
JUN-JUL	30	55	71	51	88	138
JUN-SEP	33	69	94	58	119	162
YELLOWSTONE RIVER nr Sidney (2)						
JUN-JUL	1300	1650	2000	51	2560	3928
JUN-SEP	1620	2050	2490	52	3160	4763

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

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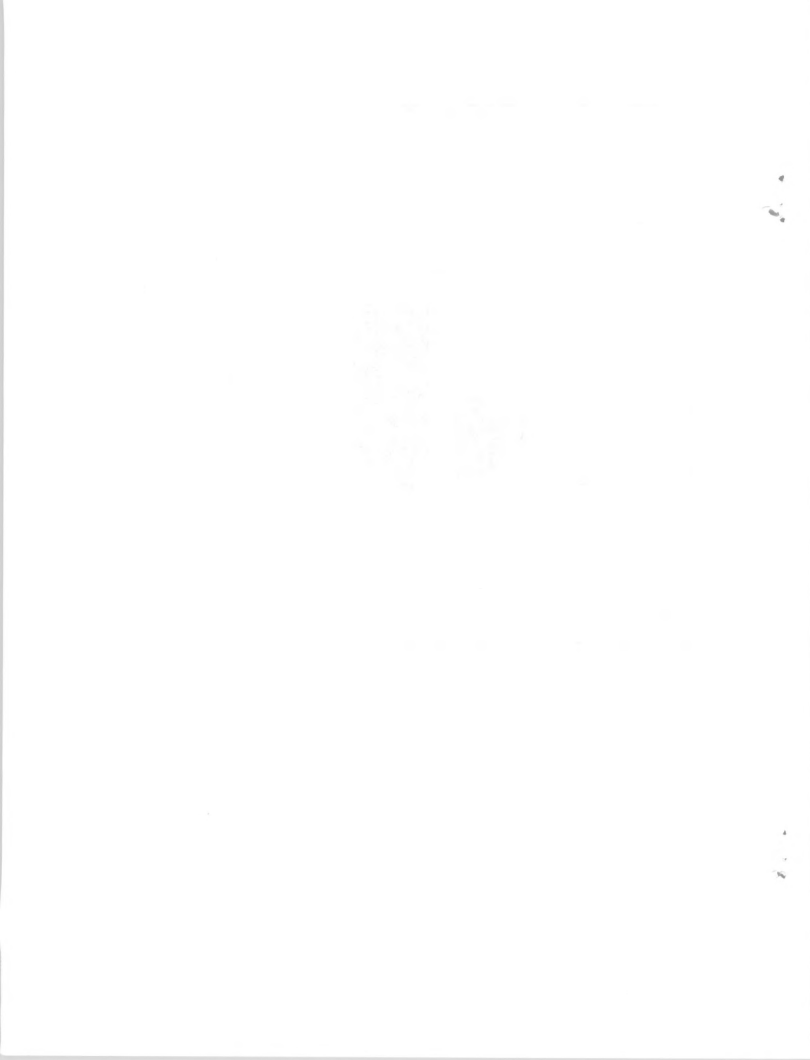
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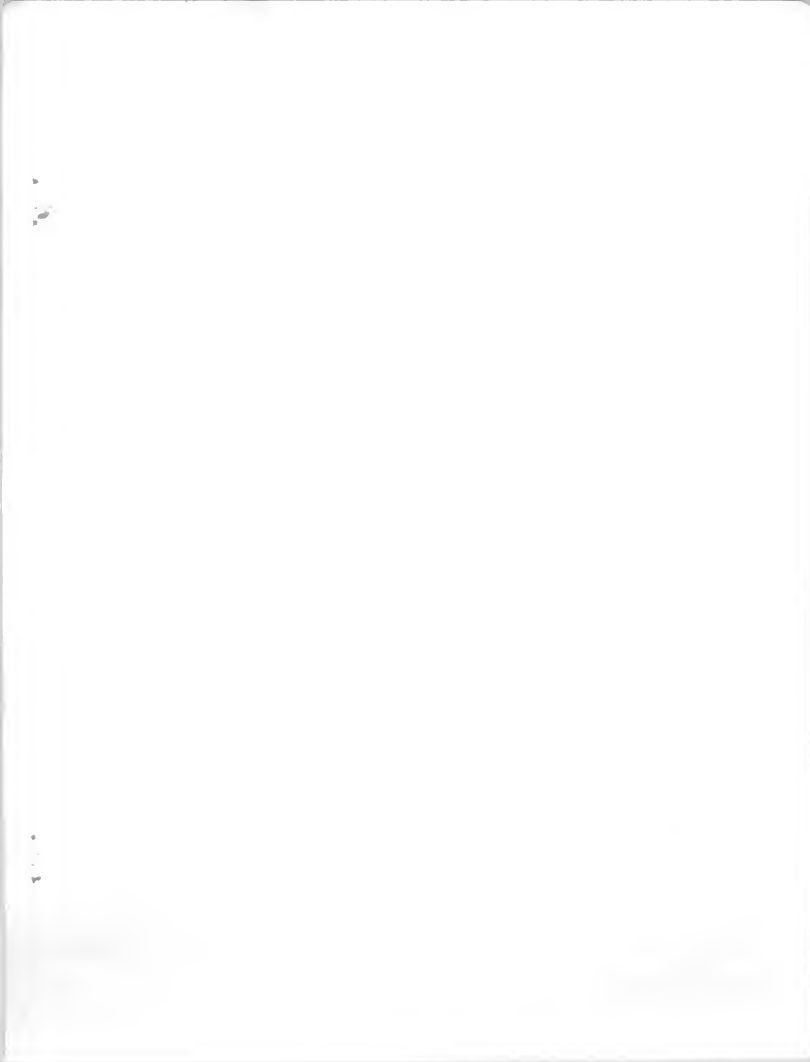


AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1979-1993, OCCURRED IN WATER YEAR 1987.

MAXIMUM SNOW WATER EQUIVALENT, 1979-1993, OCCURRED IN WATER YEAR 1983.







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SOIL CONSERVATION SERVICE

## Montana Basin Outlook Report

Soil Conservation Service  
Bozeman, MT

